

Notes on Carabid Beetles (Coleoptera, Carabidae) from East Liaoning, Northeast China

Yûki IMURA

Shinohara-chô 1249-8, Kôhoku-ku, Yokohama, 222 Japan

Abstract Twelve species of the Carabina are recorded from six localities in East Liaoning, Northeast China, with descriptions of four new taxa, including a remarkable new species of the subgenus *Cychrostomus*: *Carabus (Eucarabus) manifestus guanmenshanus* subsp. nov., *C. (E.) sternbergi fenghuangshanus* subsp. nov., *C. (Cychrostomus) mizunumaianus* sp. nov., and *C. (Coptolabrus) jankowskii benxiensis* subsp. nov.

Through the courtesy of Mr. Tetsuo MIZUNUMA, I was recently given an opportunity to examine specimens of carabid beetles collected from the eastern part of Liaoning Sheng, Northeast China, whose carabid fauna is poorly known as yet. In this paper, I am going to give a list of twelve species belonging to the genus *Carabus* (s. lat.) from six localities, with descriptions of four new taxa. It is worth noting that a remarkable new species belonging most likely to the subgenus *Cychrostomus* was discovered from the northeastern part of China.

The abbreviations used herein are the same as those explained in my previous papers, and the length of specimen is measured from the apical margin of labrum to the apices of elytra.

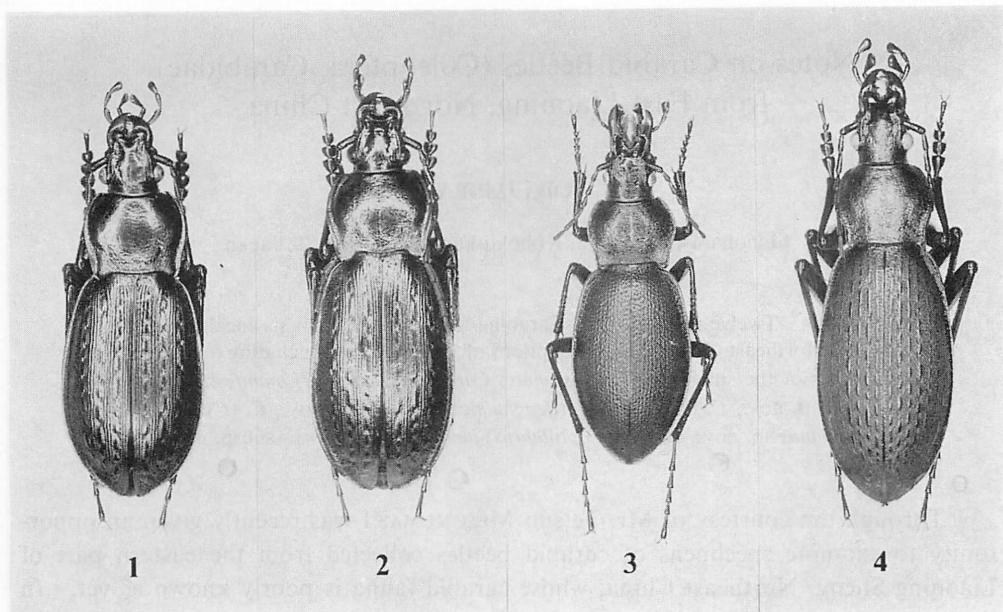
I wish to express my hearty thanks to Dr. Shun-Ichi UÉNO of the National Science Museum (Nat. Hist.), Tokyo, for reading the manuscript of this paper. Thanks are also due to Dr. Michel BRANCUCCI of the Naturhistorisches Museum Basel, Messrs. Seiji MORITA, Tokyo, Helmut SCHÜTZE, Gleichen, Hisaka MATSUI, Osaka, and Tetsuo MIZUNUMA, Toyonaka, who kindly supported this study in various ways.

1. *Carabus* (s. str.) *granulatus telluris* BATES, 1883

Carabus granulatus telluris BATES, 1883, Trans. ent. Soc. London, 1883: 223; type locality: Tonosawa, Japan.

Specimens examined. 1 ♂, 2 ♀♀, Xiaoshi, Benxi Xian, East Liaoning, 12~18-VII-1990, in coll. Y. IMURA.

Notes. The Liaoning specimens almost agree in general appearance with subsp. *telluris* described from central Honshu, Japan, except that the aedeagal apex in the former is a little slenderer than in the latter.



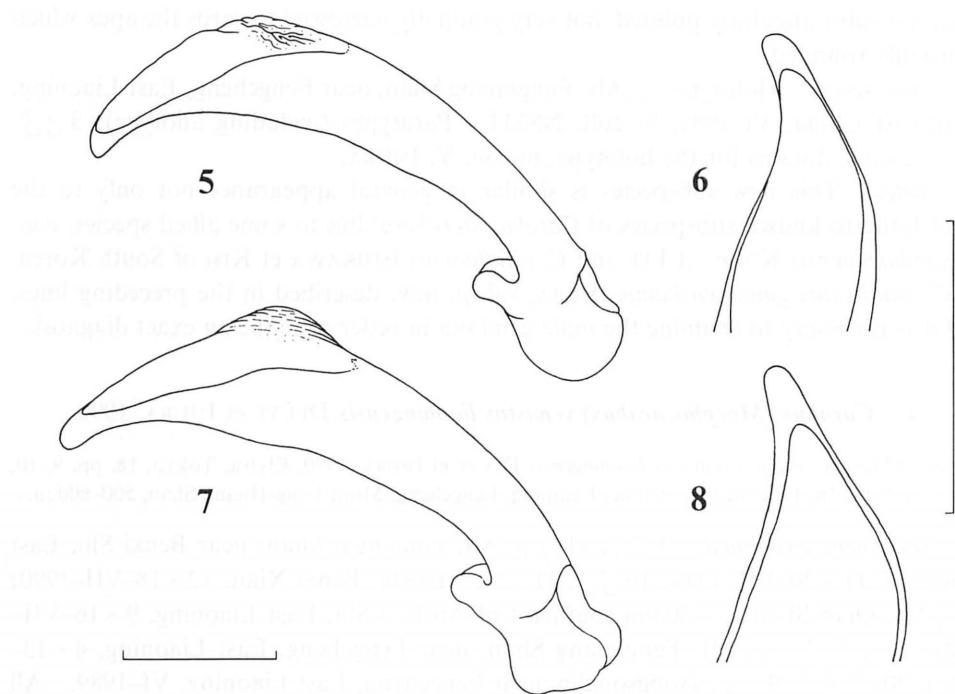
Figs. 1-4. — 1, *Carabus (Eucarabus) manifestus guanmenshanus* IMURA, subsp. nov., ♂ (holotype), from Mt. Guanmen Shan, East Liaoning; 2, *C. (E.) sternbergi fenghuangshanus* IMURA, subsp. nov., ♂ (holotype), from Mt. Fenghuang Shan, East Liaoning; 3, *C. (Cychrostomus) mizunumaianus* IMURA, sp. nov., ♀ (holotype), from Shuidong, Xiaoshi, East Liaoning; 4, *C. (Coptolabrus) jankowskii benxiensis* IMURA, subsp. nov., ♂ (holotype), from Mt. Guanmen Shan, East Liaoning.

2. *Carabus (Eucarabus) manifestus guanmenshanus* IMURA, subsp. nov.

(Figs. 1, 5, 6)

Description. Length: 20.8-24.0 mm. Body above reddish coppery, coppery green, or black with faint coppery lustre. Differs from the nominotypical form recorded from Nei Mongol Zizhiqu to Shanxi Sheng in the following points: size a little larger; frons more sparsely punctured; hind angles of pronotum more strongly protrudent posteriad, with the apices subtriangularly pointed; central part of pronotal disc less strongly convex above; elytra a little more elongate; elevated parts of primary intervals more regularly set; secondaries and tertiaries not so strongly notched transversely; striae between intervals much more weakly punctured. Aedeagus subcylindrical, with the ventral margin rather strongly arcuate near the apex; apical lobe short, subtriangularly narrowed to the apex in lateral view, almost parallel-sided with rounded tip in dorsal view.

Colour variation. Of the total 22 specimens from Mt. Guanmen Shan, 11 are reddish coppery, 6 are coppery green, and 5 are black. In the specimens from Mt. Qian Shan, 3 of 4 are reddish coppery, and the remaining one is black. Of the 8 spec-



Figs. 5–8. Male genitalia of *Carabus (Eucarabus)* spp. from East Liaoning; right lateral view (5, 7), and apical part of aedeagus, dorso-apical view (6, 8). — 5–6. *C. (E.) manifestus guanmenshanus* IMURA, subsp. nov., from Mt. Guanmen Shan, East Liaoning. — 7–8. *C. (E.) sternbergi fenghuangshanus* IMURA, subsp. nov., from Mt. Fenghuang Shan, East Liaoning. Scale: 2 mm.

imens from Xiaoshi, 3 are reddish coppery, 1 is dark coppery green, and 4 are black.

Type series. Holotype: ♂, Mt. Guanmen Shan, near Benxi Shi, East Liaoning, Northeast China, 11~20–VII–1990, in coll. NSMT. Paratypes (including allotype): 3 ♂♂, 18 ♀♀, the same data as for the holotype; 2 ♂♂, 2 ♀♀, Mt. Qian Shan, ca. 20 km southeast of Anshan Shi, East Liaoning, 9~16–VII–1990; 5 ♂♂, 3 ♀♀, Xiaoshi, Benxi Xian, East Liaoning, 12~18–VII–1990. All the paratypes are deposited in coll. Y. IMURA.

Table 1. The species of *Carabus* (Eucarabus) from China

Section 3. *Carabus (Eucarabus) sternbergi fenghuangshanus* IMURA, subsp. nov.

Material examined

(Figs. 2, 7, 8)

Description. Length: 21.7–24.5 mm. Body above coppery or black. Distinguished from the nominotypical form distributed in Korea mainly by the conformation of aedeagus: median portion much less strongly tumid nor carinate latero-ventrad at a little left side of apical third; apical lobe a little longer than wide, widest at the

base, not subtriangularly pointed, but very gradually narrowed towards the apex which is broadly rounded.

Type series. Holotype: ♂, Mt. Fenghuang Shan, near Fengcheng, East Liaoning, Northeast China, VI-1989, in coll. NSMT. Paratypes (including allotype): 3 ♂♂, 11 ♀♀, same data as for the holotype, in coll. Y. IMURA.

Notes. This new subspecies is similar in general appearance not only to the other hitherto known subspecies of *Carabus sternbergi* but to some allied species, e.g., *C. namhaedoensis* KWON et LEE and *C. nitididorsus* ISHIKAWA et KIM of South Korea, or *C. manifestus guanmenshanus* IMURA, subsp. nov. described in the preceding lines, and it is necessary to examine the male genitalia in order to make an exact diagnosis.

4. *Carabus (Morphocarabus) venustus liaoningensis* DEUVE et IMURA, 1990

Carabus (Morphocarabus) venustus liaoningensis DEUVE et IMURA, 1990, Elytra, Tokyo, 18, pp. 9, 10, figs. 7, 14, 16; type locality: Chine, Liaoning, Fengcheng, Mont Feng-Huang Shan, 500-600 m.

Specimens examined. 9 ♂♂, 11 ♀♀, Mt. Guanmen Shan, near Benxi Shi, East Liaoning, 11~20-VII-1990; 10 ♂♂, 11 ♀♀, Xiaoshi, Benxi Xian, 12~18-VII-1990; 1 ♀, Mt. Qian Shan, ca. 20 km southeast of Anshan Shi, East Liaoning, 9~16-VII-1990; 11 ♂♂, 3 ♀♀, Mt. Fenghuang Shan, near Fengcheng, East Liaoning, 4~13-VII-1990; 5 ♂♂, 9 ♀♀, Hongsonglin, near Fengcheng, East Liaoning, VI-1989. All deposited in coll. Y. IMURA.

Notes. Femora are black in the specimens from Guanmen Shan and Qian Shan, though those of the topotypical specimens are constantly much reddish. This species seems to be the commonest and the most widely distributed in the eastern part of Liaoning Sheng.

5. *Carabus (Trachycarabus) latreillei semicoriaceus* KRAATZ, 1881

Carabus semicoriaceus KRAATZ, 1881, Dt. ent. Z., 25, pp. 266, 267; type locality: "China (Liaotong)".

Specimens examined. 1 ♂, Mt. Guanmen Shan, near Benxi Shi, East Liaoning, 11~20-VII-1990; 1 ♂, 1 ♀, Caohekou, situated between Benxi Shi and Fengcheng, East Liaoning, 5~14-VII-1990. All deposited in coll. Y. IMURA.

Notes. The Liaoning specimens examined in the present study are characteristic in the conformation of the elytra, their shape being slender and subparallel-sided especially in the male, the primary intervals being a little less frequently segmented, and the striae between intervals bearing rather dense granules. These characteristics agree with those of subsp. *semicoriaceus* described by KRAATZ from "Liaotong" (=Liaodong Bandao).

6. *Carabus (Aulonocarabus) canaliculatus careniger* CHAUDOIR, 1863

Carabus careniger CHAUDOIR, 1863, Annl. Soc. ent. Fr., 31, p. 448; type area: "Mandchourie".

Specimens examined. 2♂♂, 1♀, Mt. Guanmen Shan, near Benxi Shi, East Liaoning, 11~20-VII-1990; 1♂, 1♀, Xiaoshi, Benxi Xian, East Liaoning, 12~18-VII-1990; 4♂♂, 4♀♀, Mt. Qian Shan, ca. 20 km southeast of Anshan Shi, East Liaoning, 9~16-VII-1990; 3♂♂, 3♀♀, Hongsonglin, near Fengcheng, East Liaoning, VI-1989. All deposited in coll. Y. IMURA.

7. *Carabus (Adelocarabus) seishinensis seishinensis* (LAPOUGE, 1931)

Leptocarabus (Adelocarabus) seishinensis LAPOUGE, 1931, Gen. ins., (192c), p. 597; type locality: Corée, Seishin (Neotype, ♂, Corée, Seishin, in coll. Mus. natn. Hist. nat., Paris, designated by BLUMENTHAL & DEUVE, 1984, p. 79).

Specimens examined. 2♂♂, 2♀♀, Mt. Guanmen Shan, near Benxi Shi, East Liaoning, 11~20-VII-1990, in coll. Y. IMURA.

Notes. This species has been known to be endemic to Korea, and may be recorded for the first time from the Chinese territory. The Guanmen Shan specimens are slightly different from the nominotypical form in the shape of the elytra being a little slenderer, with the widest part at about the middle, and in the condition of the elevated parts of the elytral intervals being less strongly raised. They are, however, otherwise identical with the latter, including the aedeagal characteristics, and cannot be discriminated even as a geographical race.

8. *Carabus (Tomocarabus) fraterculus fraterculus* REITTER, 1895

Carabus (Eurycarabus) fraterculus REITTER, 1895, Wien ent. Ztg., 14, p. 107; type area: "Korea".

Specimens examined. 1♀ (19.4 mm), Mt. Fenghuang Shan, near Fengcheng, East Liaoning, 4~13-VII-1990, in coll. Y. IMURA.

Notes. This species is recorded also for the first time from the Chinese territory. In comparison with the individuals distributed in the central part of the Korean Peninsula, the single female specimen recorded above is slightly different in having a little less strongly convex elytra and a little more strongly raised elevated parts of the elytral intervals, though it cannot be discriminated from the latter as a geographical race.

9. *Carabus (Cychrostomus) mizunumaianus* IMURA, sp. nov.

(Figs. 3, 9-12)

Description. Length: 19.2 mm. Width: 7.2 mm. Rather small-sized species characterised by its unique coloration and marked cychrization of the mouth-parts.

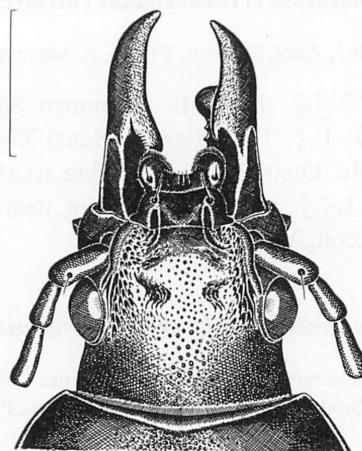
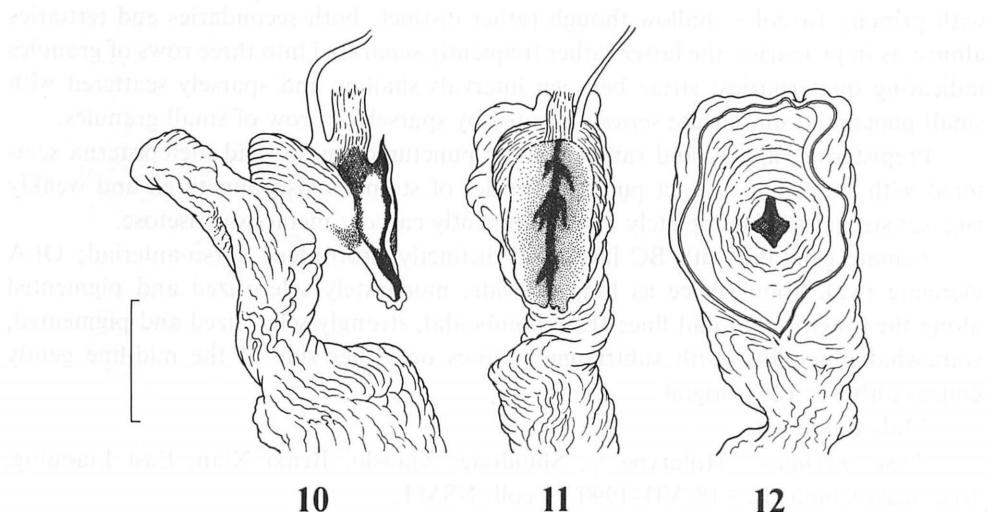


Fig. 9. Head of *Carabus (Cychrostomus) mizunumaianus* IMURA, sp. nov. (♀, holotype), from Shuidong, Xiaoshi, East Liaoning. Scale: 2 mm.

Body above dark purple and rather mat. Postero-lateral parts of pronotum and elytral margins purplish red with faint metallic lustre. Venter black with faint purplish lustre, except for epipleura and prepisterna on which the blue-purplish lustre is very strong. Appendages black.

Head large and thick, with long and less arcuate mandibles; apical emargination of labrum conspicuously deep; clypeus subquadrate, nearly as wide as labrum, with the basal portion of the sides rather acutely prominent laterad; genae below eyes conspicuously extended laterad, with the sides feebly dilated posteriad; external angles of cardo-stipes joints rather conspicuously prominent laterad, the apices of which are visible beyond the sides of genae in dorsal view; frons gently convex above and rather densely punctate, with a pair of round depressions on each side at the level of the anterior orbital margin; frontal furrows wide and shallowly carved, with the surface scattered with marked rugae and large punctures which are irregularly contiguous with one another to form semi-reticular pattern; dorsal surface of head behind eyes rather densely scattered with large punctures; mandibles extraordinarily elongate, less arcuate and almost straightly protruded forwards in basal four-fifths, then rather acutely hooked inwards at the apices, with the surface densely scattered with minute punctures; retinaculum of right mandible with the anterior tooth unusually large and thick, forming a hump-like protuberance, the posterior much smaller and thin, with the apices bidentate; retinaculum of left mandible much smaller, with the anterior tooth being invisible in dorsal view, the posterior being vestigial; penultimate segment of labial palpus bisetose; terminal segment of labial palpus triangularly dilated, less strongly so in that of maxillary palpus; apical segment of galea distinctly concave above, with the dorsal margin sharply edged; median tooth of mentum much shorter than the lateral lobes, with the apex obtuse; submentum asetose, with the surface



Figs. 10-12. Female genitalia of *Carabus (Cychrostomus) mizunumaianus* IMURA, sp. nov.; 10, right lateral view; 11, ventral view; 12, dorsal view (dorsal wall of vagina is incised and opened to show inner plate of ligular apophysis). Scale: 1 mm.

smooth; antennae absent from segment 8 on both sides, but the remaining parts are filiform and pubescent from segment 5; relative lengths of scape, pedicel and segment 3 as follows:— 1: 0.69: 0.89; segments 4 and 5 subequal in length to pedicel and segment 3 respectively; segment 6 subequal in length to segment 7, each 0.94 times as long as scape.

Pronotum subquadrate, wider than long, widest a little before the middle, rather acutely narrowed towards apex than towards base; PW/HW 1.63, PW/PL 1.48, PW/PAW 1.55, PW/PBW 1.38, PBW/PAW 1.11; apical margin moderately emarginate; front angles obtuse and slightly produced anteriad; sides gently rounded in front and weakly sinuate behind; hind angles subtriangular, rather strongly protrudent posteriad, with the apices rounded and a little bent ventrad; basal margin straight; disc moderately convex above, with the surface densely punctate in the centre, asperous or rather scabrous in the posterior parts of peripheral portions; basal impression oblong, with the surface distinctly foveolate; lateral parts rather narrowly depressed in front, and the depression rather acutely divergent towards the base, with the surface asperous; lateral margins slightly reflexed and clearly bordered throughout; two pairs of marginal setae inserted near the widest part and slightly before hind angles; basal foveae small but deep; median longitudinal line narrow but clearly recognisable.

Elytra elongate oval, rather strongly convex above, widest at about the middle, more gradually narrowed towards bases than towards apices; EW/PW 1.33, EL/EW 1.71; shoulders distinct though obtuse; lateral parts rather widely depressed near shoulders, with the margins feebly reflexed throughout and clearly bordered near bases; sculpture triploid or partly heptaploid; primaries indicated by irregular rows of granules,

with primary foveoles shallow though rather distinct; both secondaries and tertiaries almost as in primaries, the latter rather frequently separated into three rows of granules indicating quaternaries; striae between intervals shallow and sparsely scattered with small punctures; umbilicate series indicated by sparsely set row of small granules.

Prepisterna vaguely and rather densely punctured; meso- and metepisterna scattered with small but distinct punctures; sides of sternites also punctured and weakly rugose; sternal sulci completely and prominently carved; metacoxa trisetose.

Female genitalia with BC large and distinctly protrudent dorso-anteriad; OLA elongate oval, about twice as long as wide, moderately sclerotized and pigmented along the longitudinal mid-line; ILA rhomboidal, strongly sclerotized and pigmented, somewhat hinge-like, with subtriangular discs on either side of the mid-line gently concave above; ES vestigial.

Male unknown.

Type specimen. Holotype ♀, Shuidong, Xiaoshi, Benxi Xian, East Liaoning, Northeast China, 12~18~VII~1990, in coll. NSMT.

Notes. Though the single female specimen now at my hands is not sufficient for determining its true systematic position, I place it in the subgenus *Cychrostomus* on the basis of its characteristic external features, especially of the peculiar shape of the mouth-parts. This unique higher taxon was originally erected by REITTER (1896, p. 124) as a new subgenus belonging to the group *Tribacogenici* of the grand genus *Carabus*, and a description of the type species was made at the same time under the name of *anchocephalus*, whose type locality is Kuku-Noor, Northeast Tibet (the central part of Qinghai Sheng at present). This Tibetan species is considerably rare and we may have very few opportunities to examine the specimen. One of the invaluable specimens of this species was, however, shown to me by Dr. M. BRANCUCCI while I visited the Naturhistorisches Museum Basel in 1989. *Carabus mizunumaianus* nov. is readily distinguishable from the Tibetan species by much smaller size, different coloration, different shape of pronotum, etc. Two more species have hitherto been known as the members of this subgenus, namely, *facetus* SEMENOV (1903, p. 350) from the Defile of "Chatu" situated southwest of Kuku-Noor on the Burchan-Buddha Mountains, Northeast Tibet, and *pseudoprosodes* SEMENOV-TIAN-SHANSKIJ et ZNOJKO (1932, pp. 188~190) from Lantzhou-fu (=Lanzhou), in the central part of Gansu Sheng. Though I was unable to examine the specimens of these species, careful reading of the original descriptions led me to the conclusion that neither the Burchan-Buddha species nor the Lanzhou one agrees in many respects with the specific characters of the Liaoning one. Examination of the male genitalia of all the known species remains to be made in order to clarify the taxonomic position of the subgenus, to prove the interspecific relationship within the subgenus, and to determine the true affinity of *C. mizunumaianus* nov.

10. *Carabus (Acptolabrus) constricticollis constricticollis* (KRAATZ, 1886)

Coptolabrus constricticollis KRAATZ, 1886, Dt. ent. Z., 30, pp. 241, 242; type locality: Suyun.

Specimens examined. 1 ♂ (24.8 mm), 1 ♀ (27.6 mm), Mt. Guanmen Shan, Benxi Shi, East Liaoning, 11~20-VII-1990, in coll. Y. IMURA.

Notes. Both the specimens from Guanmen Shan are peculiar in the coloration: head and pronotum metallic green, the latter having the margins and the basal part purplish, elytra deep purplish blue. This is the same colour pattern as that appearing in *Carabus (Acptolabrus) munakatai* ISHIKAWA, especially in the population distributed in the central part of the Oshima Peninsula, Southwest Hokkaido, Northeast Japan (cf. IMURA, 1991, pp. 20, 21, pls. 1, 2), and such a colour pattern is reported for the first time in *C. constricticollis*. Otherwise, they agree in every feature with the nominotypical subspecies.

11. *Carabus (Coptolabrus) jankowskii benxiensis* IMURA, subsp. nov.

(Fig. 4)

Description. Length: 31.8~36.2 mm. Colour as in subsp. *taebeagsanensis* ISHIKAWA et KIM distributed on the Taebaek Mountain Range of South Korea; head and pronotum metallic green, elytra dark bluish purple with the margins metallic blue, prosternum, pro- and mesepisterna with greenish lustre, epipleura with blue-greenish lustre. Allied to the nominotypical subspecies, but distinguished from it by the following respects: front angles of pronotum obtuse and gently rounded; sides of pronotum less acutely narrowed towards apex and not so strongly sinuate behind; hind angles of pronotum less strongly protrudent posteriad; elevated parts of elytral intervals less strongly raised; rows of granules between elytral suture and first (=innermost) primary intervals contiguous with one another to form reticular pattern in the basal half of elytra.

Type series. Holotype: ♂, Mt. Guanmen Shan, Benxi Shi, East Liaoning, 11~20-VII-1990, in coll. NSMT. Paratypes (including allotype): 1 ♂, 2 ♀♀, same data as for the holotype, in coll. Y. IMURA.

12. *Carabus (Coptolabrus) smaragdinus longipennis* (CHAUDOIR, 1863)

Coptolabrus longipennis CHAUDOIR, 1863, Annls. Soc. ent. Fr., 31, p. 449; type area: "nord de la Chine".

Specimens examined. 2 ♂♂, 2 ♀♀ (29.5~36.7 mm), Xiaoshi, Benxi Xian, East Liaoning, 12~18-VII-1990; 1 ♂, 1 ♀ (32.9~33.7 mm), Caohekou, Benxi Shi, East Liaoning, 5~14-VII-1990. All deposited in coll. Y. IMURA.

Colour variation. In the Xiaoshi specimens, the colour of head and pronotum is metallic green bearing blue-purplish lustre, and the elytra are dark purplish blue or bluish purple. In the specimens from Caohekou, head and pronotum are reddish

coppery or greenish coppery, and the elytra are metallic green.

Notes. Subspecific determination of the Liaoning specimens is not definitive at present, since I have been unable to examine the type specimen of *longipennis* which was described by CHAUDOIR from "nord de la Chine" without indication of detailed locality. The Liaoning specimens are characteristic in the shape of pronotum, which is widest a little behind the middle, having the sides rather acutely narrowed towards apex with the margins hardly rounded, and the apex much narrower than the base (PAW/PBW 0.70–0.87, mean ca. 0.77).

要 約

井村有希：中国遼寧省東部のオサムシ。——中国遼寧省のオサムシに関する知見はいまだにきわめて不十分で、基礎となる資料の集積が必要な段階にあると思われる。本論文では、1989年と1990年に同省東部の6地点から得られた12種のオサムシをリストアップするとともに、1新種と3新亜種の記載を行なった。

本地域に産するオサムシには、朝鮮半島および極東から中国東北部にかけて分布する種との共通種が多いが、本溪市小市の水洞で得られた種は、近隣諸地域に比肩すべきものない、きわめて顕著な新種であった。得られた標本がただ1頭の雌であるために、雄交尾器の形態に基づく類縁関係の推定はできないが、その特異な外部形態、とりわけいちじるしく特殊化した口器の形態などから、本種をホソキバオサムシ亜属 *Cychrostomus* の一員とみなし、*Carabus (Cychrostomus) mizunumaianus* と命名した。本亜属に属する種はいずれもきわめて稀で、これまでに3種が青海省と甘粛省から知られているにすぎない。今回、既知種の分布域から2,000 km以上も東方に隔たった遼寧省からこのような種の発見されたことは、生物地理学的にみても特筆すべきことといえよう。

そのほか、本溪市近郊の关门山から、*Carabus (Eucarabus) manifestus* の新亜種 *guanmenshanus* とヤンコフスキーカブリモドキ *C. (Coptolabrus) jankowskii* の新亜種 *benxiensis* を記載し、同地のホソクビナガオサムシ *C. (Acoptolabrus) constricticollis* は頭部と前胸背板が金緑色、上翅が青紫色彩を呈する独特の色彩型であることを報告した。また鳳城市近郊の鳳凰山からは、ステルンベルクツヤオサムシ *C. (Eucarabus) sternbergi* の新亜種 *fenghuangshanus* を記載した。

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